

Mechanisms of S2S Precipitation Predictability

Andrew W Robertson

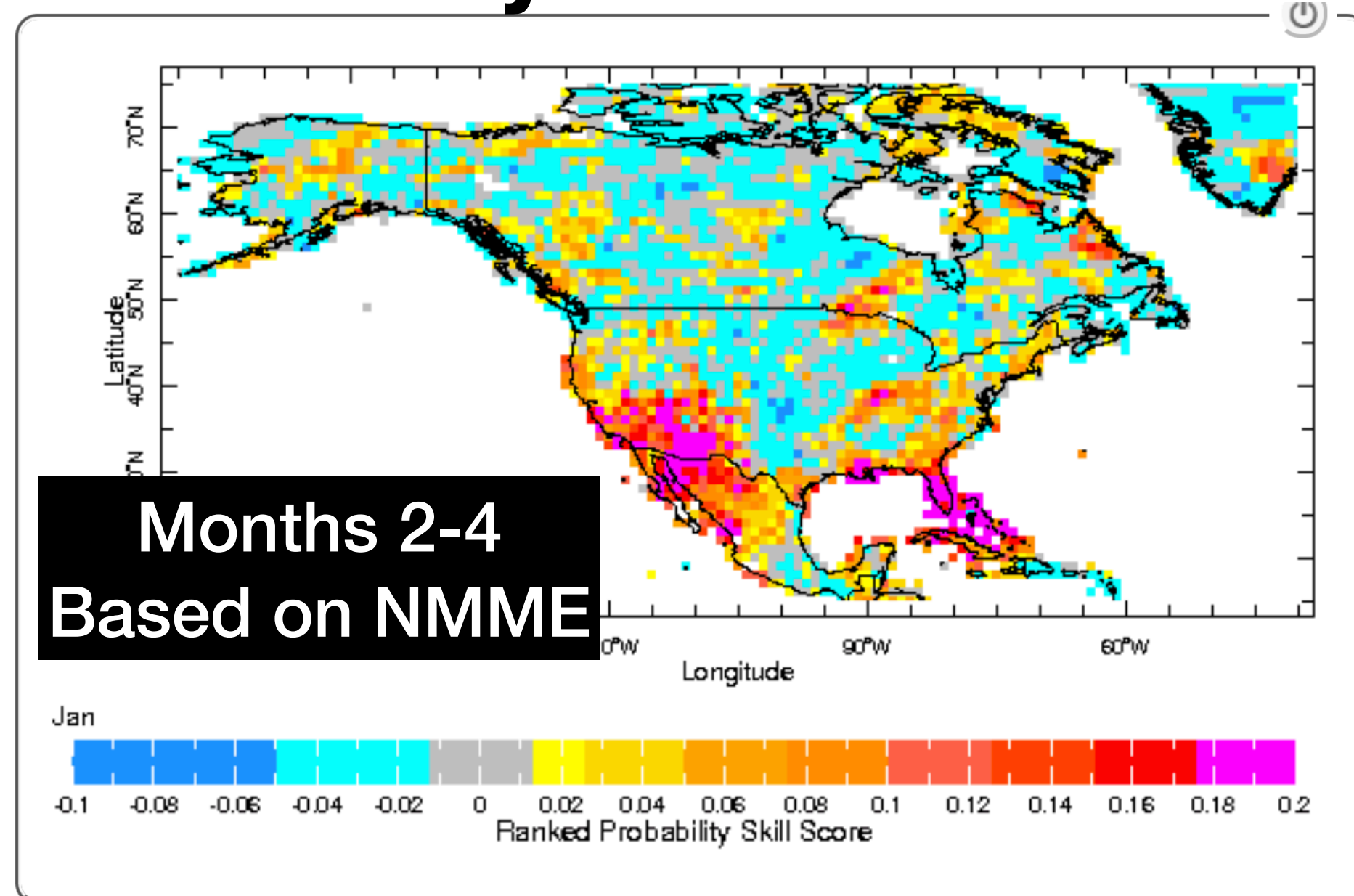


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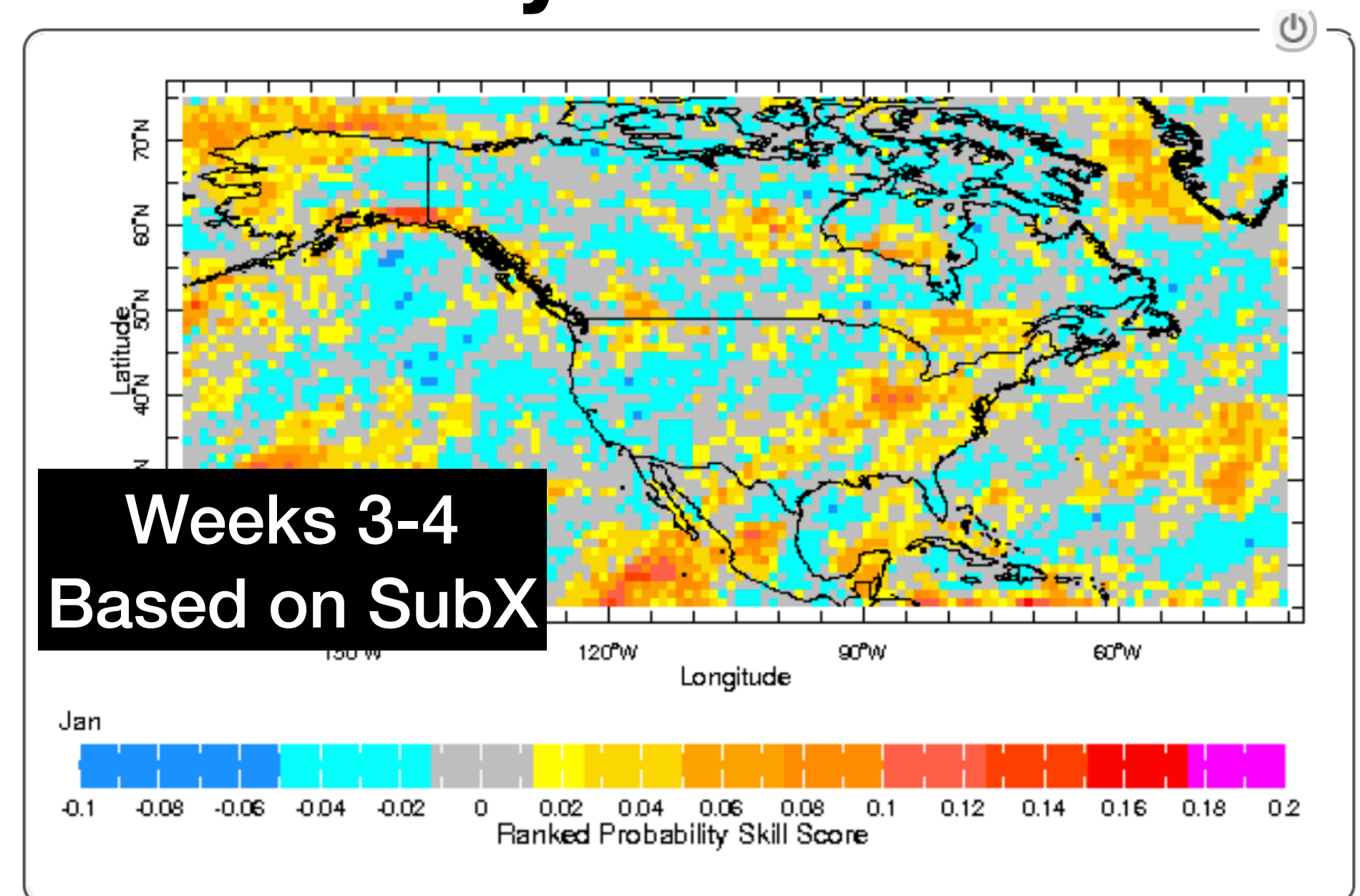
*NOAA-DOE Precipitation Processes and Predictability
Workshop, November 30, 2020*

IRI Multi-model Precipitation Skill (Jan)

Issued every month ...



Issued every week ...

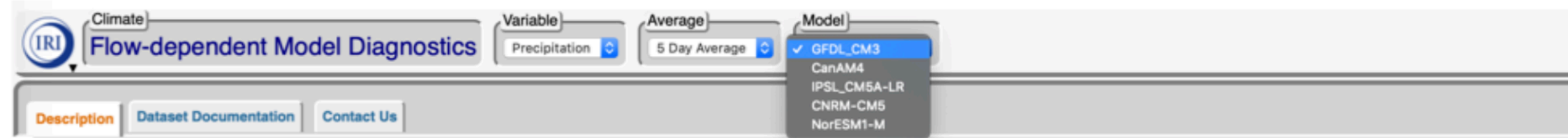


Ranked
Probability
Skill
Score

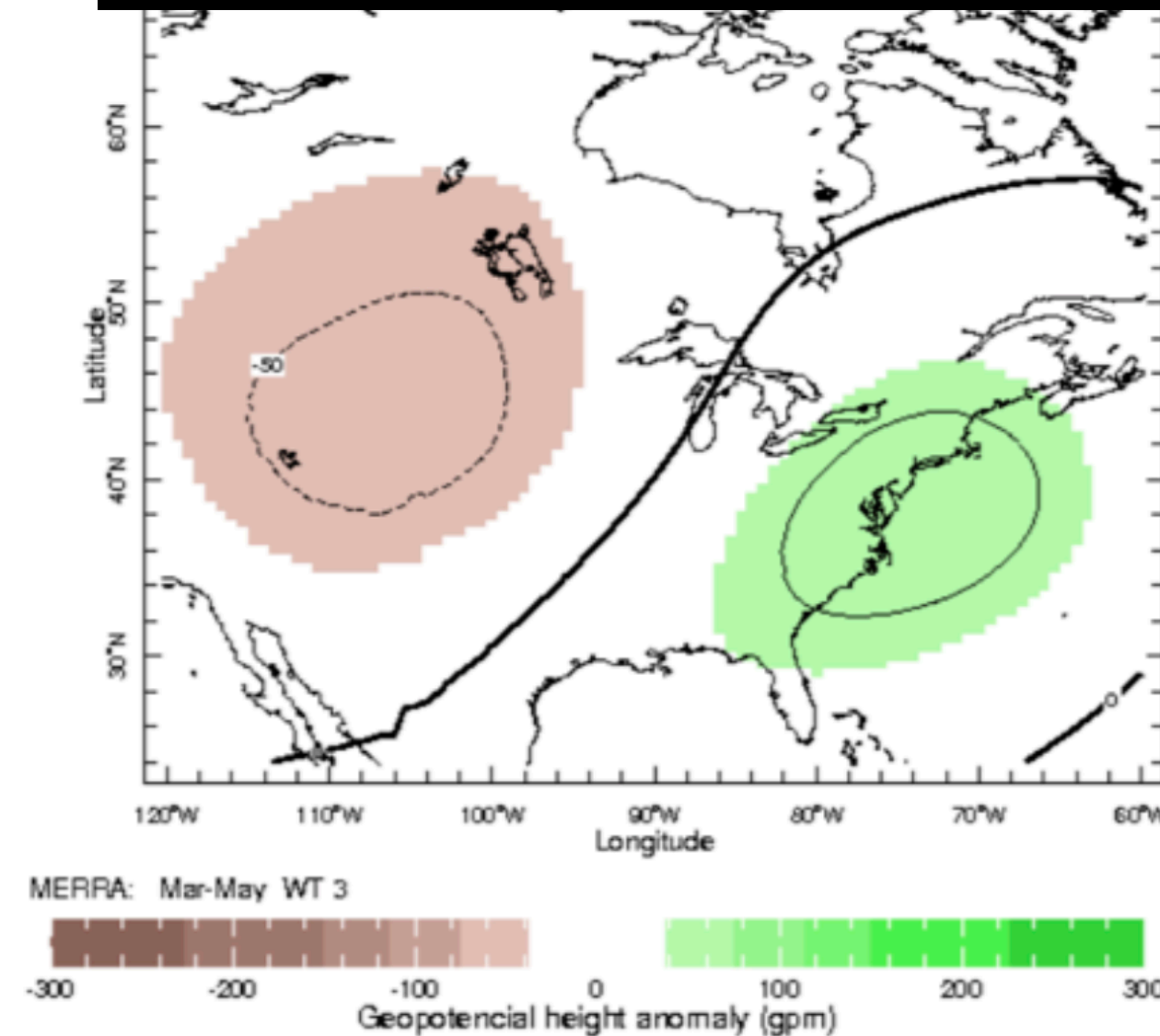
- Low precipitation skill in both seasonal and subseasonal forecasts

<http://iridl.ldeo.columbia.edu/maproom/Global/index.html>

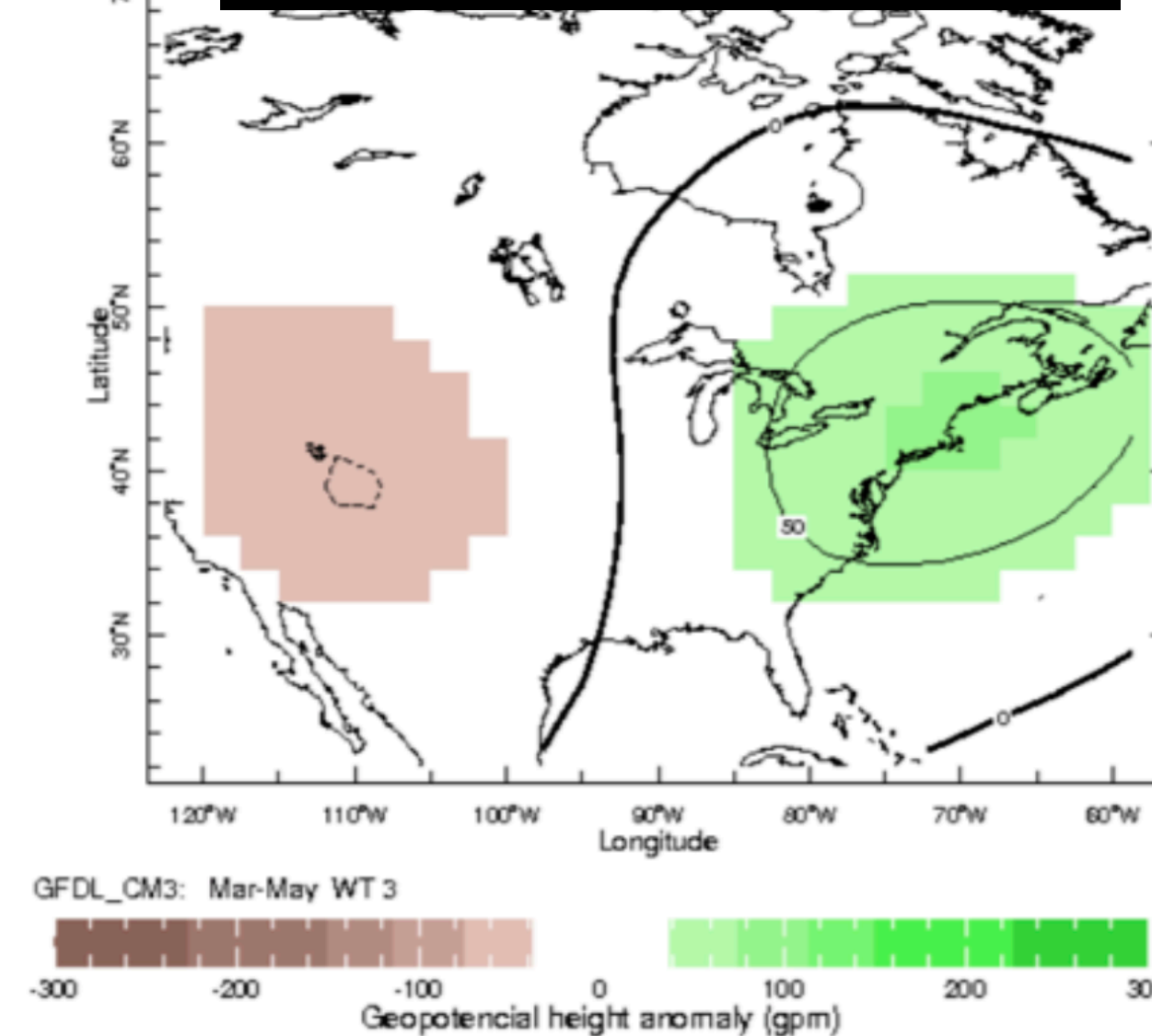
Large-Scale Circulation Regimes: **Systematic Errors**



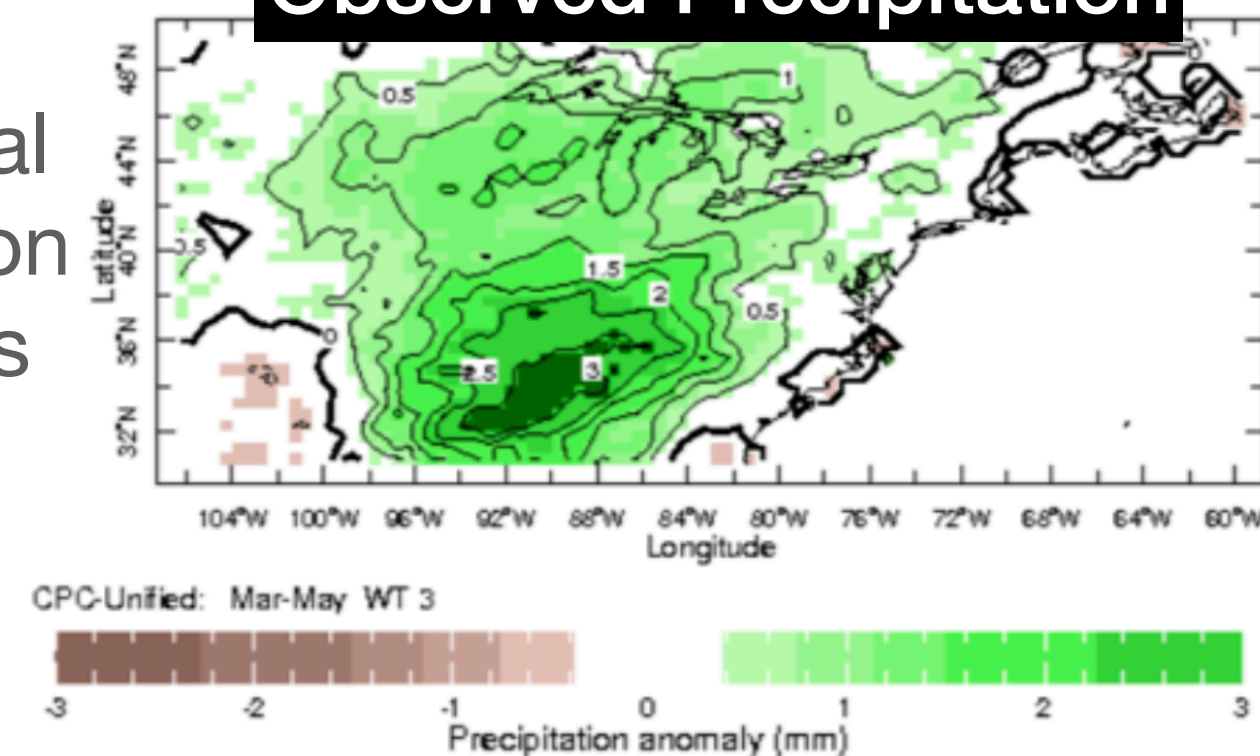
Reanalysis Circulation Type 3



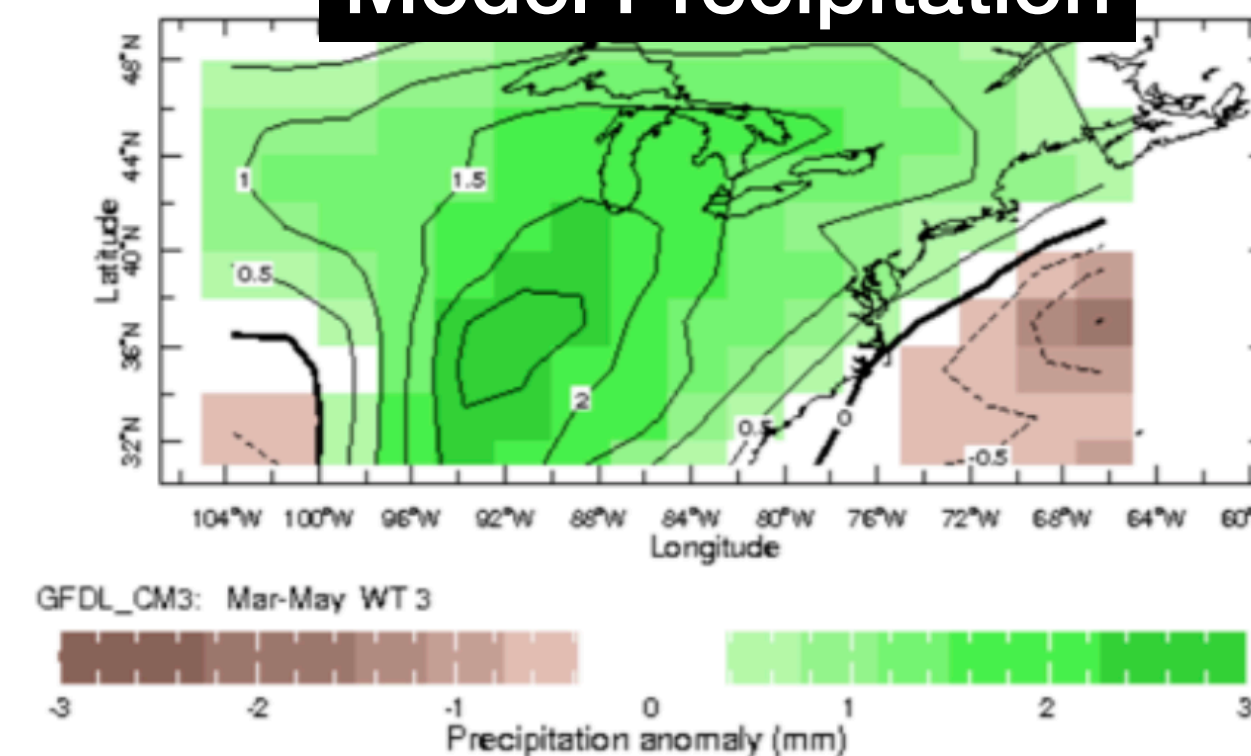
Model Circulation Type 3



Observed Precipitation



Model Precipitation



- Regional-scale precipitation is **synoptically controlled** by large-scale circulation patterns
- Model representations of these patterns often contain significant biases in structure

Conditional
Precipitation
Anomalies

Ángel Muñoz, IRI
AGU Poster

<http://iridl.ldeo.columbia.edu/maproom/Global/index.html>

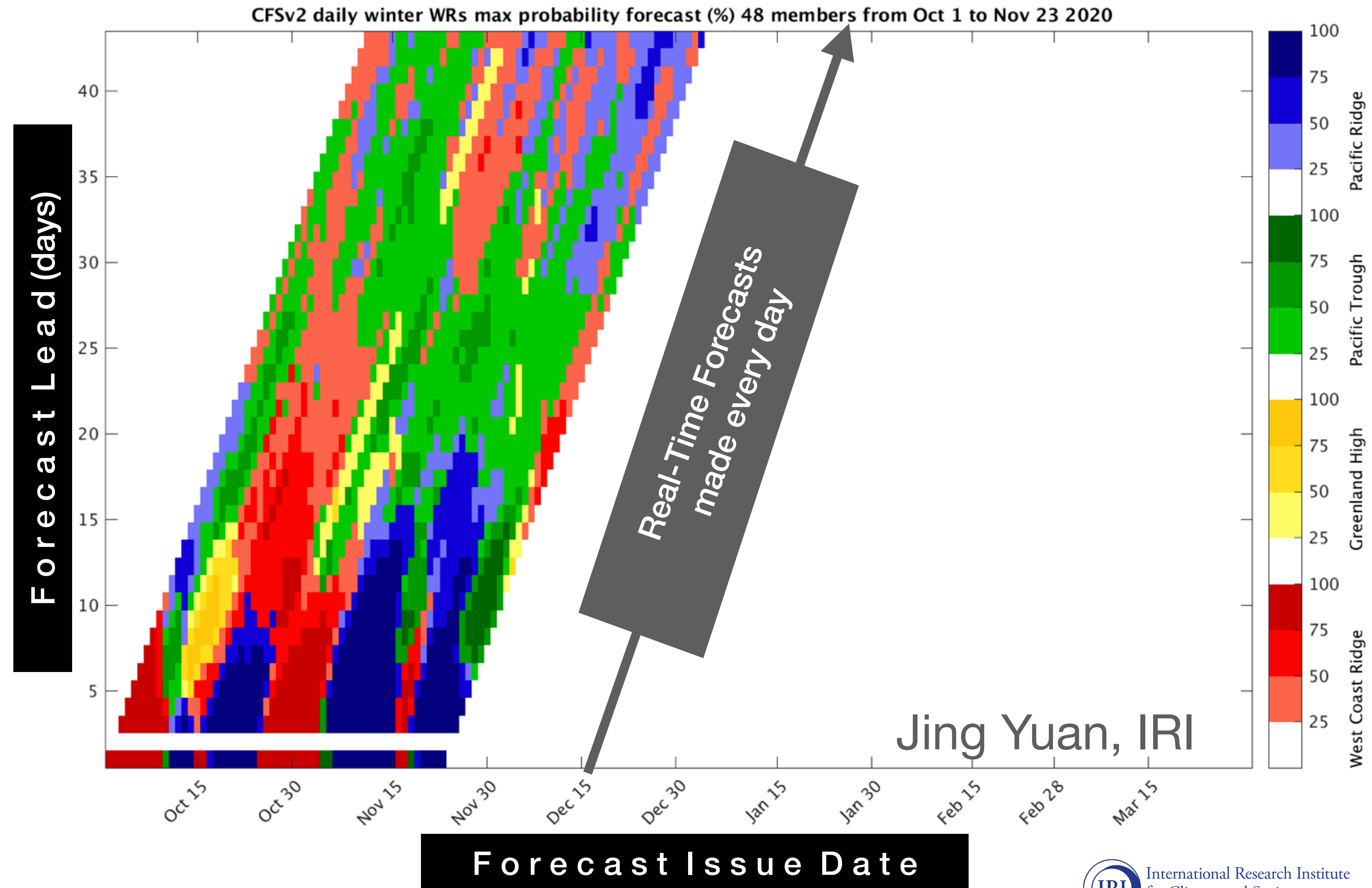
Large-Scale Circulation Regimes: S2S Prediction

<https://wiki.iri.columbia.edu/index.php?n=Climate.S2S-WRs>

And ...

- Models often fail to forecast these regimes beyond 2 weeks ahead

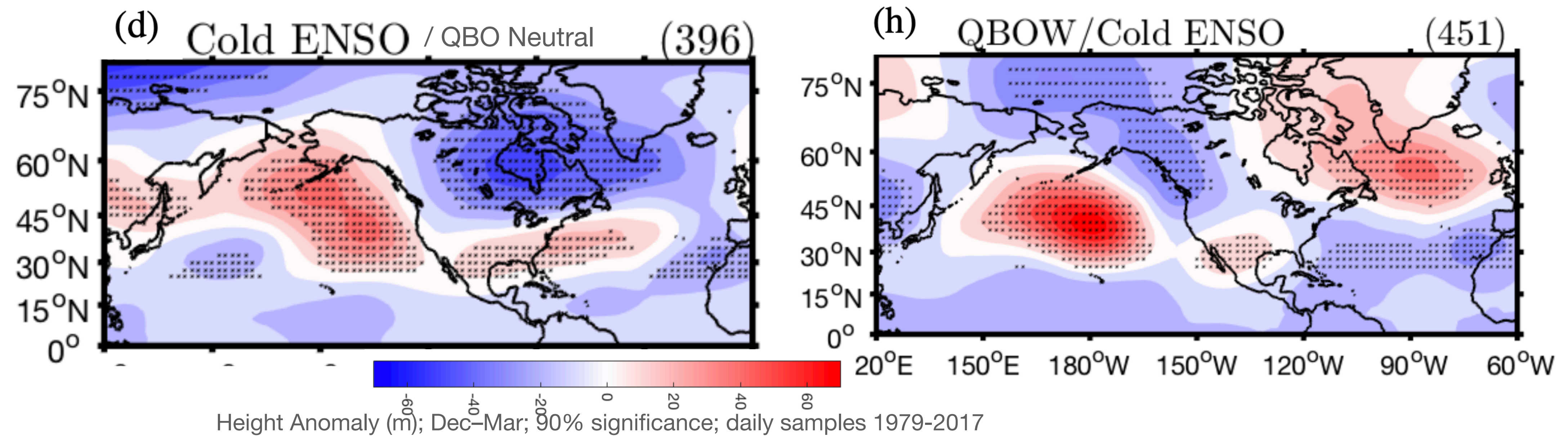
Representing the episodic sources of S2S predictability and their interactions (ENSO, MJO, QBO, SSWs) in models is critical



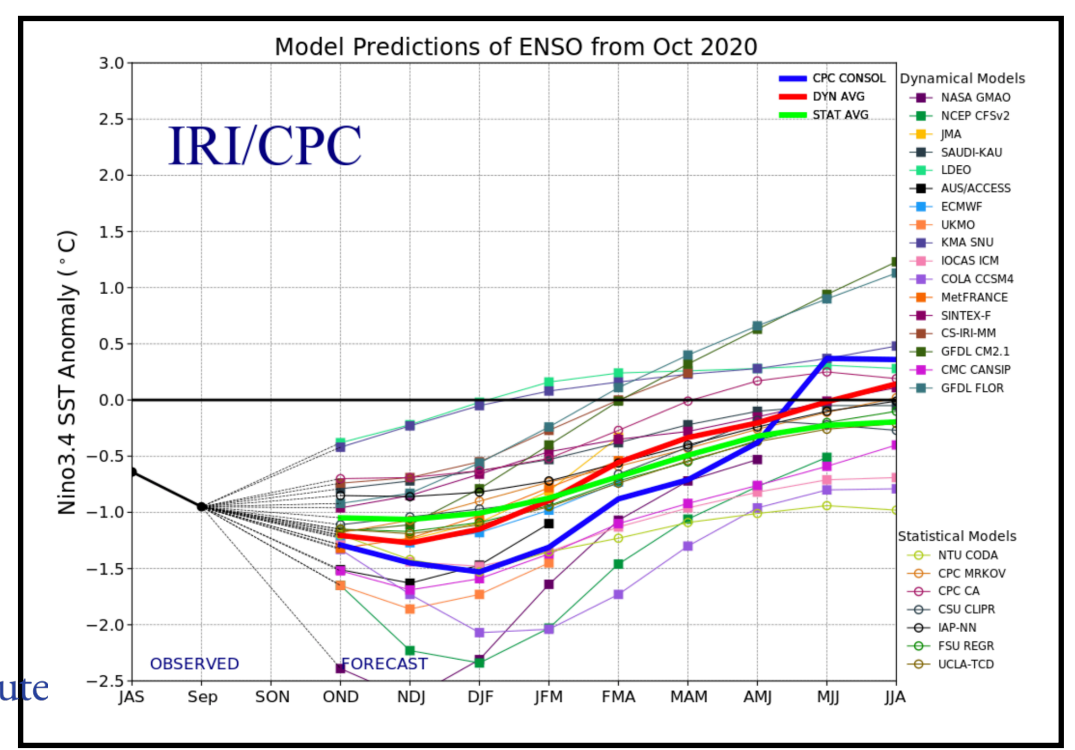
Climate Drivers

Geopotential height (500hPa) Composites for La Niña and Westerly QBO

- Pacific Ridge is typical of La Niña winters
- The ridge is amplified with a West Coast trough when La Niña occurs in the westerly phase of the QBO.
- QBO Westerly is likely to persist through the winter 2020/21

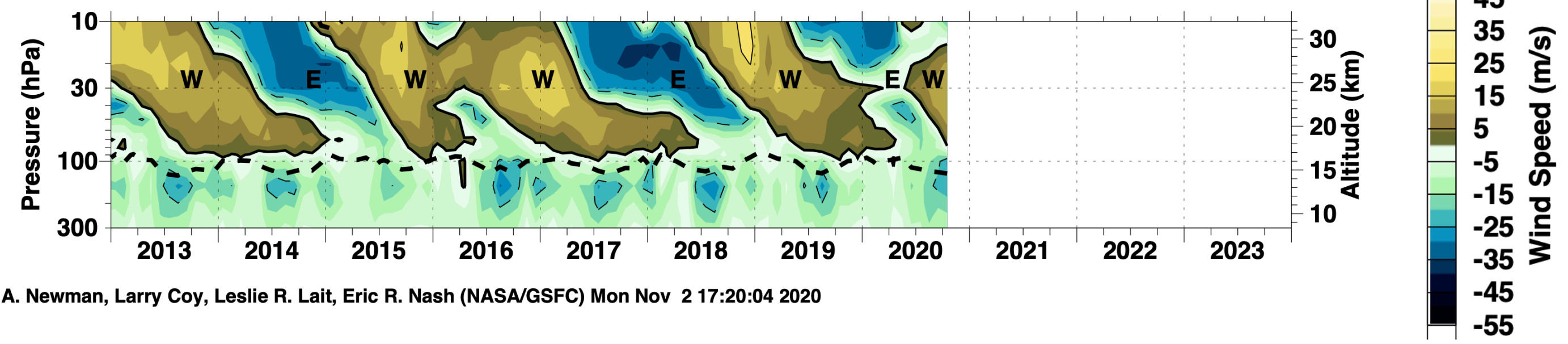


Niño 3.4 Index



Bohar Singh, IRI

Singapore Sonde QBO from monthly mean zonal wind



Paul A. Newman, Larry Coy, Leslie R. Lait, Eric R. Nash (NASA/GSFC) Mon Nov 2 17:20:04 2020